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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/786,232	03/02/2001	Lin-Ying Hu	612.39651X00	8272
7590 10/10/2003			EXAMINER	
Antonelli Terry Stout & Kraus Suite 1800 1300 North Seventeenth Street Arlington, VA 22209			LE, TOAN M	
			ART UNIT	PAPER NUMBER
			2863	

DATE MAILED: 10/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/786,232

Applicant(s)

HU ET AL.

Examiner

Toan M Le

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The claimed invention is directed to non-statutory subject matter because the application concerns a method for gradual deformation of representations by generating a sequential simulation of a stochastic Gaussian model in order to constrain a set of data collected in a heterogeneous medium such as an underground zone to adjust conditioning data to the model parameters. The invention is related to a mathematical model for history matching and not designed to control or perform any processes in underground activities such as sensing or measuring any physical quantities.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 23-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Referring to claims 23-26, the specification fails to state or teach the steps of: generating a first and second uniform realizations of at least a part of the stochastic model using a sequential simulation; linearly combining the first and second realizations; forming an objective function; and minimizing the objective function. Without this disclosure, one skilled in the art cannot practice the invention.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 23-26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-4 of U.S. Patent No. 6,618,695. A comparison of the claims is presented on the table below:

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US Patent No. 6,618,695	Instant Application 09/786232
<p>1. A method of providing an optimized Gaussian, optimized lognormal or optimized truncated Gaussian stochastic model of a distribution of a parameter <u>in a heterogeneous underground medium</u> by fitting a set of measured non linear data forming a response of the medium, comprising:</p> <ul style="list-style-type: none"> a) generating a first realization of at least a part of the stochastic model and deducing therefrom a first set of non-linear data forming a response of the model; b) generating at least one another realization of a same part of the stochastic model independent from the first realization and deducing therefrom corresponding sets of non-linear data as a response of the model; c) forming a realization of the stochastic model by linearly combining the first realization and the at least one other realization, with coefficients of the combination being such that a sum squares of the coefficients is equal to 1 and deducing therefrom a corresponding set of non-linear data as a response of the model; d) forming an objective function that measures a misfit between the sets of non-linear data deduced from the step c) with corresponding non-linear data measured from the medium; and e) minimizing the objective function with respect to the coefficients of the combination of the realizations until an optimized realization of the stochastic model is obtained. <p>3. A method as claimed in claim 1, comprising: performing gradual deformations of parts of the stochastic model while preserving continuity of the parameter between the parts and then applying a correlation operator L defined by a variogram to all of the white noises.</p> <p>4. A method as claimed in claim 1, comprising: performing gradual deformation of the stochastic model while modifying statistical parameters relative to structure of the medium.</p>	<p>23. A method for gradual deformation of a realization generated by use of a sequential simulation, of a stochastic model not limited to a Gaussian stochastic model of a physical quantity <u>in a heterogeneous medium</u>, in order to constrain the realization to a set of data collected in the medium by means of previous measurements and observations, relative to the state or structure thereof, comprising:</p> <ul style="list-style-type: none"> a) generating a first uniform realization of at least a part of the stochastic model using a sequential simulation, the first realization corresponding to a realization of a uniform vector and transforming the first uniform realization to a corresponding first Gaussian realization; b) generating at least a second uniform realization of the part of the stochastic model independent from the first realization, at least one of the realization corresponding to a realization of the uniform vector, and transforming the at least one second uniform realization to a corresponding second Gaussian realization; c) linearly combining the first Gaussian realization and the second Gaussian realization, with coefficients of the combination of the first and second Gaussian realizations being such that a sum of squares of the coefficients is equal to 1, transforming the linearly combined Gaussian realization to a combined uniform realization and forming a realization of the stochastic model by sequential simulation with the combined uniform realization; d) forming an objective function that measure misfit between sets of data computed from the formed realization of the stochastic model representing the physical quantity, and the corresponding data measured from the heterogeneous medium; and e) minimizing the objective function with respect to the coefficients until obtaining an optimized realization of the stochastic model. <p>25. (26.) A method as claimed in claim 23 (24), comprising: separately deforming a number n of parts of the stochastic model representative of the heterogeneous medium while preserving continuity between the n parts of the model by subdividing the uniform vector into n mutually independent subvectors.</p> <p>24. A method as claimed in claim 23, comprising: gradually deforming off the stochastic model representative of the heterogeneous medium simultaneously in relation to structural parameters and to random numbers.</p>

Although the conflicting claims are not identical, they are not patentably distinct from each other because one having ordinary skilled in the art at the time the invention was made to have applied the method described in Patent No. 6,618,695 to any heterogeneous medium for history matching conditioning data and model parameters.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toan M Le whose telephone number is (703) 305-4016. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703) 308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

Toan Le

September 17, 2003



John Barlow
Supervisory Patent Examiner
Technology Center 2800